

Proposed Core Hypothesis/Question Justification

Social Environment Working Group

Social Ties

I. Proposed Core Hypotheses/Questions

Hypothesis 1. *Social connections are associated with a broad range of child health outcomes via social support (emotional, instrumental, informational), social engagement, and social influence.*

Sub-Hypothesis 1.1: Social ties that provide instrumental and/or emotional support to families and children help to prevent the onset of asthma and other chronic childhood health problems and to facilitate its management.

Sub-Hypothesis 1.2: Social relationships that are abusive contribute to the onset of depression and other mental health problems, and adversely affect physiological function. In parents, these effects result in impaired parenting.

Sub-Hypothesis 1.3: First generation and more recent Mexican immigrants experience lower rates of obesity and infant mortality in part because of their stronger social ties within ethnic communities that share norms for physical activity, healthy dietary habits, and other behaviors.

Sub-Hypothesis 1.4: Weak ties and diverse social ties result in greater access to information, and other resources relevant to promoting health.

Hypothesis 2. *Neighborhood social cohesion, collective efficacy, and social capital influence child health outcomes through such mechanisms as social control, social influence, and stress.*

Sub-Hypothesis 2.1. Collective efficacy in neighborhoods reduces the incidence of high risk behaviors among children and adolescents, such as smoking, drinking, and drug use.

Sub-Hypothesis 2.2. When maintaining social cohesion imposes excessive obligations and role strain on individual subgroups (e.g., women), residing in highly cohesive neighborhoods may be associated with worse mental health outcomes.

II. Workgroup: *Social Networks*

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IV. Public health significance

There are at least three aspects of “social connectedness” that are relevant to public health. These may be defined as follows:

Social networks - defined as the web of person-centered social ties (Berkman and Glass, 2000). Its assessment includes structural aspects of social relationships, such as size (number of network members), density (extent to which members are connected to one another), boundedness (degree to which ties are based on group structures such as work, neighborhood), and homogeneity (extent to which individuals are similar to each other). Its assessment may also extend to aspects such as frequency of contact, extent of reciprocity, duration, and so forth.

Social support - defined as the functional characteristics of social ties. Typically categorized into different types of support, e.g., emotional, instrumental, appraisal, and informational (House et al. 1988).

Social capital - defined by the features of social structures – such as trust, norms and sanctions, appropriable social institutions, and information channels – that facilitate collective action (Coleman, 1990). The definition is contested (see for example, Portes, 1998) and evolving, but most versions encompass two components: the structural and cognitive. The *structural* component of social capital includes the extent and intensity of associational links and activity in society (e.g., density of civic associations; measures of informal sociability; indicators of civic engagement). The *cognitive* component assesses people's perceptions of trust, sharing, and reciprocity. An additional distinction is made between bonding and bridging social capital. Bonding capital refers to social cohesion within a group structure. Bridging capital refers to the type that links across different communities and groups (Harpham et al. 2002).

Considerable evidence supports the role of social networks, social support, and social capital in maintaining health throughout the life course (see section VI). Social connectedness is believed to confer generalized host resistance to a broad range of health outcomes, ranging from morbidity, mortality, health behaviors, and functional outcomes (Cassel, 1976). Alongside SES and various forms of “stress”, social connectedness has emerged as one of the fundamental (and empirically robust) determinants of individual and population health. Social connectedness has been linked to health outcomes independently of SES and stress (*main effects* model). Social connectedness may also *buffer* the deleterious health consequences of socioeconomic disadvantage and stress. Growing evidence suggests that social networks and social support are amenable to intervention, and represent a practical channel for health improvement (Cohen et al. 2000).

For all of the foregoing reasons, it is critical that a cohort study of child health should include an assessment of social connectedness. Despite the wealth of observational evidence linking social connectedness to physical and mental health outcomes, a number of questions remain unanswered, including:

- Understanding the exact mediating pathways and mechanisms by which different aspects of social ties affect health – e.g., do weak ties matter as much as strong ties (Granovetter, 1982).
- Examining the influence of social ties on specific child health outcomes, such as asthma and early-onset depression.
- Understanding the differential effects of social connectedness in diverse population groups – e.g., whether there are SES and gender differences in the health impact of social connectedness (Belle, 1987).
- Understanding the effects of social ties across the life course – e.g., the relative influence of family versus peer group social support in the development of risk and protective health behaviors.
- Examining the intersections of social connectedness and acculturation in explaining the “Latino health paradox”.
- Understanding the characteristics of families, caregivers, and communities that help to link children to positive social ties.
- Testing the relevance of social connectedness at the community level (through processes such as collective efficacy and social cohesion) for health outcomes.
- Exploring the “downsides” of social connectedness – i.e., recognizing that not all forms of social ties are uniformly health-promoting.

Our working group hypotheses have been deliberately selected to address some of these unanswered questions.

V. Justification for a large prospective, longitudinal study

There are several advantages to testing our hypotheses in a large prospective study:

- Longitudinal data are required because it is recognized that the relationship between social connectedness and health is *reciprocal*, i.e., ill health can result in a change in both the level and nature of social networks and support. Preserving the correct temporal sequence between exposure and outcomes is essential for inferring causality, and for understanding the ways in which health and social connectedness influence each other over the course of development.
- Examining the influence of social connectedness across the life course similarly demands a longitudinal design. For example, there may be critical periods (such as the antenatal period, or early infancy) during which social support may exert a greater influence on subsequent health outcomes. Levels of social support and networks may also *change* over time, and there is interest in testing *latency* and *cumulative* effects of social connectedness on health. An example of a latency effect of social support is when the social environment during infancy (e.g., lack of parental attachment) determines the subsequent trajectory of a child’s health (e.g., early onset depression), in spite of later changes (improvement) in their receipt of social support.

- Observational data linking social connectedness to health outcomes have often been criticized because of the failure to take account of *common cause bias*, e.g., the level of social ties and poor health outcomes in adult individuals may reflect a third, underlying cause, such as a hostile personality. By appropriately measuring such characteristics early in the life course, the potential ability exists to tease out such non-causal explanations. This is usually not possible in studies of adult populations (even if they have a longitudinal design), because we cannot determine if a hostile personality preceded the formation of social ties.
- Testing the *multi-level* nature of social connectedness (e.g., individuals with varying degrees of social connectedness nested within communities of varying degrees of cohesion) demands a hierarchical data structure with sufficient numbers of observations at different levels to allow us to tease out the compositional influences of social ties from any contextual influences. Moreover, there must be sufficient variability at higher levels (e.g., between communities that are low or high in social capital) to adequately power Hypothesis 2.
- Examining multiple, *overlapping* exposures (e.g., family social support versus peer group social support) requires a sufficiently large sample size to power such analyses.
- Examining the differential impacts of social connectedness on population subgroups (e.g., women, Mexican immigrants, low SES groups) requires a large enough sample to represent these groups.
- Testing interactions (e.g., cross-level interactions between community characteristics and individual characteristics; or gene-environment interactions) demands a large sample size.

VI. Scientific Merit

Social connectedness and health

Recognition of the importance of social ties for health dates back to Bowlby (1969), who maintained that secure attachments are not only necessary for food, warmth, and other material resources, but also because they provide love, security, and other non-material resources necessary for normal human development (quoted in Berkman, and Glass, 2000). Certain periods during the life course may be critical for the development of bonds and attachment (Fonagy, 1996). According to attachment theory, secure attachments during infancy satisfy a universal human need to form close affectional bonds and lay the basis for the creation and maintenance of such bonds throughout life.

There is a substantial body of epidemiological evidence linking social networks and social support to positive physical and mental health outcomes throughout the lifecourse (Stansfeld, 1999). Over a dozen prospective epidemiological studies in adult populations have now reported that social networks predict the risk of all-cause and cause-specific mortality (including cardiovascular disease, cancer, and traumatic causes of death). Both social networks and social support have been linked to prognosis and survival following major illness, including

myocardial infarction, stroke, and certain types of cancer, e.g., melanoma (Berkman and Glass, 2000). Experimental evidence now exists to suggest that social connectedness may also confer host resistance against the development of infections, mediated through psycho-neuro-immunological mechanisms (Cohen et al. 2000). For mental health outcomes, a wealth of evidence supports the notion that social ties buffer the effects of stressful life events in psychiatric disorders, particularly depression.

The diverse pathways by which social ties are hypothesized to promote health include provision of tangible resources (money, labor in kind, information); emotional support which may buffer the negative appraisal of stressful events; social engagement (connection to productive activities); and social influence (maintenance of healthy norms and behaviors). Few epidemiological studies have tested these mediating pathways directly.

To date, several intervention studies have been carried out (including some that are in progress) to test whether the provision of social support can improve health outcomes. The evidence from intervention trials, in contrast to observational studies, has been mixed. For example, several trials have been carried out to test whether social support provided in clinical settings can improve pregnancy outcomes (including low birthweight) among high risk women. These trials have yielded mixed results (Korenbrod and Moss, 2000). The inconsistent findings in social support intervention trials may be consistent with at least three alternative interpretations: (a) it is difficult to provide sufficient social support to high risk individuals in clinical settings; (b) it is difficult to demonstrate an effect of social support unless individuals with reducible psychosocial risk can be identified; or (c) there is no reliable effect of social support intervention on health outcomes.

Importantly, the contradictory findings of observational and intervention studies might be reconciled through a better understanding of the mediating mechanisms by which social support promotes health. In other words, better designed and more in-depth observational studies of social ties have the potential to inform the design of future interventions (Cohen et al. 2000).

Social connectedness in children and parents

The nature of social relationships changes over the course of development. During infancy and early childhood, the primary ties of importance to the child are within the family. A large literature in developmental psychology links the quality of early parent-infant attachment to children's social competence in middle childhood (e.g., Sroufe, 1979; Rubin et al, 1998), and to healthy social development in adolescence and adulthood (Repetti et al., 2002). Ties to parents and other family members remain important throughout childhood and adolescence, as do parenting processes that influence children's social development.

In early and middle childhood, the child's social world expands to include nonfamily adults and peers and children's social competencies are practiced and refined. In middle childhood, the nature of children's peer group experiences change, with peer group size expanding, increased sex-segregation, the formation of stable groups or cliques, the development of popularity hierarchies, and increased reciprocity, commitment, and affectional bonds within relationships. (McHale, et al, forthcoming). In adolescence, the importance of peer relationships continues to increase and the development of close cross-sex relationships emerges. Research has demonstrated the importance of childhood peer relationships in predicting future adjustment. This may occur both because of common causal influences on social behavior in childhood and later life stages (e.g., temperament) and because of the effects of limited or dysfunctional peer

interactions in early life on the ability to refine social competencies (Hymel et al 1990; Kupersmidt and Coie, 1990).

Over the course of development, health is likely influenced by both the social connectedness of caregivers and by the child's own social relationships. A limited body of research has documented associations between caregiver stress, caregiver social isolation and child health outcomes (e.g., Wright et al, 1998; Wright et al, 2002); evidence also documents the significance of social support during pregnancy for fetal growth (Feldman et al., 2000). However, much remains to be learned about the social, psychological, behavioral, and biological pathways involved in these relationships.

A recent review (Repetti et al., 2002) summarizes research on the effects of specific family characteristics (conflict, aggression, and cold, unsupportive, or neglectful parenting) on a "cascade" of outcomes that undermine children's social competence, and, ultimately, their mental and physical health. These outcomes include disruptions in biological systems that regulate responses to stress, deficits in the emotion processing, and the development of social skills, social cognition, and oppositional orientations towards other people. These outcomes influence health through effects on immune function and other pre-disease pathways as well as through influencing the extent and nature of children's social interactions with others. While a substantial body of research supports the existence of specific components of this model, no data set to date has had the capacity to examine the entire model.

VII. Potential for innovative research

Besides the health outcomes mentioned in our hypotheses (asthma, depression, obesity, and risky behaviors), we expect that the assessment of social connectedness in the cohort study will be relevant to the examination of a wide variety of other child health outcomes. The innovative aspects of our hypotheses (i.e., expected novel findings) include:

- Potential to assess the influence of social connectedness at different stages of the life-course, e.g., antenatally, during infancy, and during adolescence, and the influence of genetic and environmental factors in developmental processes that influence sociability and social connectedness.
- Potential to assess social connectedness at multiple levels (children nested within families, nested within communities).
- Potential to assess social connectedness in overlapping contexts (family versus peer groups).
- Potential to assess the influence of social ties on health outcomes where data are sparse, e.g. asthma, and to look for gene-environment interactions.
- Potential to address the detailed mediating pathways by which different aspects of social ties (e.g., weak ties versus strong ties; emotional support versus instrumental support) influence specific health outcomes.
- Potential to examine the differential impact of social ties on diverse population groups, e.g., whether social ties can account for the Latino health paradox.
- Potential to address both the negative and positive consequences of social ties.

VIII. Feasibility

A. Sampling needs

Ideally, aspects of social connectedness should be assessed at multiple time points, encompassing both critical periods (antenatally, during infancy, during adolescence) as well as capturing changes over time. Assessment should take place at different levels (within families, within communities, within peer groups). Our hypotheses also call for recruitment and perhaps oversampling of low income families, and diverse race/ethnic groups (Latino minorities).

B. Measurement strategies

Ideally, measurement of social ties and the functions they serve should be accomplished through measurement of the complete social networks in which individuals are embedded. This approach permits measurement not only of the individual's *perception* of the existence of supportive ties (which may be colored by other attributes of the individual), but also of the individual's location within interacting social groups. The availability of global network data permits researchers to measure the density of networks, the position of the individual (central or peripheral, popular or unpopular) within networks, the extent to which perceived ties are reciprocated, and the extent of social connectivity across networks. These attributes have consequences for the influence of social ties on norms and behavior, access to new ideas, and emotional support.

Collection of global network data is difficult and expensive. We propose that it be undertaken in the National Children's Study only in a small number of selected sites that will be intensively studied on other dimensions of the social environment. In these sites, we suggest assessing global networks within schools at intervals of 2-3 years beginning at age 8. We also suggest measuring parents' social networks in greater depth at key intervals, probably during pregnancy, age 8, and during adolescence.

Individual perceptions of social connectedness should be ascertained regularly (every one to two years). A variety of existing tools are available for assessing different aspects of social connectedness (see table below) among adults. Comparable tools in children need exploration.

Table. Ways of assessing social connectedness (from Berkman and Glass, 2000)

Type of measure	Sources
Social Networks	
Social network index	Berkman and Syme, 1979
New Haven EPESE Network Assessment	Seeman and Berkman, 1988; Glass et al. 1997
Social Support	
Social Support scale	Lin et al. 1979
Perceived Social Support Scale	Blumenthal et al. 1987
Medical Outcomes Study social support	Sherbourne and Stewart, 1991

Interpersonal Support Evaluation List	Cohen and Hobermann, 1983
Social Capital	
Collective efficacy, social cohesion scales, from the Community Survey of the Project on Human Development in Chicago Neighborhoods	Sampson et al. 1997
Community Social Capital Benchmark Survey	Saguaro seminar (Putnam), 2001
Australian Social Capital Assessment Tool	Bullen and Onyx, 1998
World Bank Social Capital Assessment Tool	Krishna and Shrader, 1999

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